

8<sup>th</sup> International Laser Physics Workshop  
Lphys'99

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Budapest, July 2-6, 1999

Program

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**8<sup>th</sup> International Laser Physics Workshop  
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**Program**

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# 8th ANNUAL INTERNATIONAL LASER PHYSICS WORKSHOP (LPHYS'99)

## ORGANIZED BY:

*General Physics Institute, Russian Academy of Sciences, Moscow, Russia*

*The international journal "Laser Physics"*

*Hungarian Academy of Sciences*

*Research Institute for Solid State Physics and Optics, Hungarian Academy of Sciences, Budapest, Hungary*

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#### Background

The eighth annual International Laser Physics Workshop (LPHYS'99) will be held from July 2 to July 6, 1999 in Budapest, Hungary. The Workshop will be a part of the World Conference for Science which will be the main UNESCO conference in 1999.

LPHYS'99 continues a series of Workshops held in Dubna 1992, Moscow/Volga river tour 1993, New York 1994, Moscow/Volga river tour (jointly with NATO SILAP Workshop) 1995, Moscow 1996, Prague 1997, and Berlin 1998.

The total number of Workshop participants is expected to be about 200. In the past, participation was typically from over 20 countries.

#### Proceedings

The Workshop materials accepted by the Steering and Advisory & Program Committees (plenary, invited, and contributed) will be published in the international journal Laser Physics. The total length of manuscript, including figures, tables and references, is limited to twelve pages. The rules of the manuscripts' preparation can be found in every issue after Issue 3 of 1995 or on the Laser Physics web site: <http://www.maik.rssi.ru/journals/lasphys.htm>

Two hard copies of manuscripts to be published in the journal Laser Physics can be either given to Prof. Igor V. Yevseyev, the Deputy Editor-in-Chief of Laser Physics, or mailed to: Prof. Igor V. Yevseyev, Department of Theoretical Physics, Moscow State Engineering Physics Institute, 31 Kashirskoe Shosse, Moscow 115409, Russia. No e-mail versions of papers please.

## **Scientific Seminars and Symposium**

The workshop consists of the following seminars and symposium (organized by the respective cochairs) which feature invited plenary talks, contributed oral and poster papers. The official language of the workshop will be English.

### **Seminar 1**

#### **Modern Trends in Laser Physics**

Co-Chairs:

Charles M. Bowden (USA)  
Kirill A. Prokhorov (Russia)  
Wolfgang Sandner (Germany)

### **Seminar 2**

#### **Strong Field Phenomena**

Co-Chairs:

Wilhelm Becker (Germany)  
See Leang Chin (Canada)  
Gyôzô Farkas (Hungary)  
Mikhail V. Fedorov (Russia)

### **Seminar 3**

#### **Laser Spectroscopy**

Co-Chairs:

Frank K. Tittel (USA)  
Wilhelmus Witteman (The Netherlands)  
Valery M. Yermachenko (Russia)

### **Seminar 4**

#### **Solid State Lasers and Nonlinear Optics**

Co-Chairs:

Gunter Huber (Germany)  
Takatomo Sasaki (Japan)  
Ivan A. Shcherbakov (Russia)

### **Seminar 5**

#### **Laser Methods in Medicine**

Co-Chairs:

Sergey A. Gonchukov (Russia)  
Gerhard J. Müller (Germany)  
Rudolf Steiner (Germany)

### **Symposium**

#### **Status and Future Directions of High-Power Laser Installations**

Co-Chairs:

See Leang Chin (Canada)  
Wolfgang Sandner (Germany)  
Ivan A. Shcherbakov (Russia)

## **Meeting Format and Location of the Events**

|                         |        |                           |
|-------------------------|--------|---------------------------|
| Welcome Remarks         | July 2 | 09.00-09.45 Auditorium    |
| Welcome Party           | July 2 | 19.30-23.00 Hotel Olympia |
| Conference Dinner       | July 4 | 19.30-23.00 Hotel Olympia |
| Closing Remarks         | July 6 | 18.15-18.25 Hall A        |
| <u>Plenary Sessions</u> | July 2 | 09.45-11.45 Auditorium    |
|                         | July 3 | 09.00-10.30 Auditorium    |
|                         | July 4 | 09.00-11.45 Auditorium    |
|                         | July 5 | 09.00-10.30 Auditorium    |
|                         | July 6 | 09.00-10.30 Auditorium    |
| <u>Seminar 1</u>        | July 2 | 11.55-18.50 Hall A        |
|                         | July 3 | 11.00-18.50 Hall A        |
|                         | July 4 | 11.55-18.50 Hall A        |
|                         | July 5 | 11.00-18.50 Hall A        |
|                         | July 6 | 11.00-12.45 Hall A        |
|                         | July 6 | 14.00-15.40 Hall B        |
| Poster session          | July 6 | 11.00-12.45 Vestibule     |
| <u>Seminar 2</u>        | July 2 | 11.55-18.50 Hall B        |
|                         | July 3 | 11.00-18.50 Hall B        |
|                         | July 4 | 11.55-18.50 Hall B        |
|                         | July 5 | 11.00-18.50 Hall B        |
| Poster session          | July 6 | 11.00-12.45 Vestibule     |
| <u>Seminar 3</u>        | July 2 | 11.55-18.50 Hall C        |
|                         | July 3 | 11.00-18.50 Hall C        |
| Poster session          | July 4 | 14.00-15.40 Vestibule     |
| <u>Seminar 4</u>        | July 4 | 11.55-18.50 Hall C        |
|                         | July 5 | 11.00-18.50 Hall C        |
| <u>Seminar 5</u>        | July 5 | 11.00-18.15 Hall D        |
|                         | July 6 | 11.00-16.15 Hall C        |
| Poster session          | July 6 | 14.00-17.00 Vestibule     |
| <u>Symposium</u>        | July 6 | 14.00-18.15 Hall A        |

## **Plenary talks**

- Bruce H.T. Chai (University of Central Florida, Orlando, USA)  
*Self frequency doubling in the Nd and Yb doped yttrium calcium oxyborate crystals*
- Louis DiMauro (Brookhaven National Laboratory, Upton, USA)  
*Strong-Field Interactions in the Tunneling Regime*
- D. DiVincenzo (IBM T. J. Watson Research Center, USA)  
*Prospects for Quantum Computing*
- W. Hogervorst (Vrije Universiteit, Amsterdam, The Netherlands)  
*XUV Laser Spectroscopy of Atoms and Molecules*
- W. Howard Lowdermilk (Lawrence Livermore National Laboratory, Livermore, USA)  
*NIF and the Path to Inertial Fusion Energy*
- Harm G. Muller (FOM-Institute, Atoms in Strong Field, Amsterdam, The Netherlands)  
*Resonance Enhancement of Recollision Processes in Strong-Field Photoionization as Revealed by Accurate Numerical Simulation*
- Wolfgang P. Schleich (Universität Ulm, Ulm, Germany)  
*The Art of Measuring Quantum States*
- Marlan O. Scully (Texas A&M University, USA)  
*Advances in Quantum Optics and Laser Physics via Quantum Coherence*
- Sune Svanberg (Lund Institute of Technology, Lund, Sweden)  
*Medical Diagnostics Using Laser Techniques*
- Nikolai I. Tankovich (Thermolase Co., USA)  
*Laser Cosmetical Treatments in Dermatology*
- Herbert Walther (Max-Planck-Institut für Quantenoptik, Garching, Germany)  
*The Generation of Fock-States in the One-Atom Maser*



## Scientific Program --- Schedule

|                        | Auditorium        | Hall A       | Hall B    | Hall C    | Hall D    |
|------------------------|-------------------|--------------|-----------|-----------|-----------|
| Friday, July 2, 1999   |                   |              |           |           |           |
| 09.00-09.45            | Welcome Rem.      |              |           |           |           |
| 09.45-10.30            | Scully            |              |           |           |           |
| 10.30-11.00            | Coffee Break      |              |           |           |           |
| 11.00-11.45            | Svanberg          |              |           |           |           |
| 11.55-12.45            |                   | Seminar 1    | Seminar 2 | Seminar 3 |           |
| 12.45-14.00            | Lunch             |              |           |           |           |
| 14.00-16.15            |                   | Seminar 1    | Seminar 2 | Seminar 3 |           |
| 16.15-16.45            | Coffee Break      |              |           |           |           |
| 16.45-18.50            |                   | Seminar 1    | Seminar 2 | Seminar 3 |           |
| 19.30-23.00            | Welcome Party     |              |           |           |           |
| Saturday, July 3, 1999 |                   |              |           |           |           |
| 09.00-09.45            | Walther           |              |           |           |           |
| 09.45-10.30            | Hogervorst        |              |           |           |           |
| 10.30-11.00            | Coffee Break      |              |           |           |           |
| 11.00-12.45            |                   | Seminar 1    | Seminar 2 | Seminar 3 |           |
| 12.45-14.00            | Lunch             |              |           |           |           |
| 14.00-16.15            |                   | Seminar 1    | Seminar 2 | Seminar 3 |           |
| 16.15-16.45            | Coffee Break      |              |           |           |           |
| 16.45-18.50            |                   | Seminar 1    | Seminar 2 | Seminar 3 |           |
| Sunday, July 4, 1999   |                   |              |           |           |           |
| 09.00-09.45            | Schleich          |              |           |           |           |
| 09.45-10.30            | Chai              |              |           |           |           |
| 10.30-11.00            | Coffee Break      |              |           |           |           |
| 11.00-11.45            | Muller            |              |           |           |           |
| 11.55-12.45            |                   | Seminar 1    | Seminar 2 | Seminar 4 |           |
| 12.45-14.00            | Lunch             |              |           |           |           |
| 14.00-16.15            |                   | Seminar 1    | Seminar 2 | Seminar 4 |           |
| 16.15-16.45            | Coffee Break      |              |           |           |           |
| 16.45-18.50            |                   | Seminar 1    | Seminar 2 | Seminar 4 |           |
| 19.30-23.00            | Conference Dinner |              |           |           |           |
| Monday, July 5, 1999   |                   |              |           |           |           |
| 09.00-09.45            | DiMauro           |              |           |           |           |
| 09.45-10.30            | Lowdermilk        |              |           |           |           |
| 10.30-11.00            | Coffee Break      |              |           |           |           |
| 11.00-12.45            |                   | Seminar 1    | Seminar 2 | Seminar 4 | Seminar 5 |
| 12.45-14.00            | Lunch             |              |           |           |           |
| 14.00-16.15            |                   | Seminar 1    | Seminar 2 | Seminar 4 | Seminar 5 |
| 16.15-16.45            | Coffee Break      |              |           |           |           |
| 16.45-18.50            |                   | Seminar 1    | Seminar 2 | Seminar 4 | Seminar 5 |
| Tuesday, July 6, 1999  |                   |              |           |           |           |
| 09.00-09.45            | Tankovich         |              |           |           |           |
| 09.45-10.30            | DiVincenzo        |              |           |           |           |
| 10.30-11.00            | Coffee Break      |              |           |           |           |
| 11.00-12.45            |                   | Seminar 1    |           | Seminar 5 |           |
| 12.45-14.00            | Lunch             |              |           |           |           |
| 14.00-16.15            |                   | Symposium    | Seminar 1 | Seminar 5 |           |
| 16.15-16.45            | Coffee Break      |              |           |           |           |
| 16.45-18.15            |                   | Symposium    |           | Seminar 5 |           |
| 18.15-18.25            |                   | Closing Rem. |           |           |           |

## Plenary Sessions

### Friday, July 2, 1999

#### Welcome Remarks

- 09.00-09.15 N. Kroó, Co-Chairman of Workshop  
09.15-09.25 P.P. Pashinin, Deputy Chairman of Workshop  
09.25-09.35 J. Janszky, the Member of Steering Committee, Chairman of the Local Organizing Committee  
09.35-09.45 I.V. Yevseyev, the Member of Steering Committee, Deputy Editor-in-Chief of Laser Physics journal

Chair: P.P. Pashinin (Russia)

- 09.45-10.30 Marlan O. Scully (Texas A&M University, USA)  
*Advances in Quantum Optics and Laser Physics via Quantum Coherence*  
10.30-11.00 Coffee Break

Chair: N. Kroó (Hungary)

- 11.00-11.45 Sune Svanberg (Lund Institute of Technology, Lund, Sweden)  
*Medical Diagnostics Using Laser Techniques*

### Saturday, July 3, 1999

Chair: K.A. Prokhorov (Russia)

- 09.00-09.45 Herbert Walther (Max-Planck-Institut für Quantenoptik, Garching, Germany)  
*The Generation of Fock-States in the One-Atom Maser*

Chair: V.M. Yermachenko (Russia)

- 09.45-10.30 W. Hogervorst (Vrije Universiteit, Amsterdam, The Netherlands)  
*XUV Laser Spectroscopy of Atoms and Molecules*

### Sunday, July 4, 1999

Chair: Ch.M. Bowden (USA)

- 09.00-09.45 Wolfgang P. Schleich (Universität Ulm, Ulm, Germany)  
*The Art of Measuring Quantum States*

Chair: I.A. Shcherbakov (Russia)

- 09.45-10.30 Bruce H.T. Chai (University of Central Florida, Orlando, USA)  
*Self frequency doubling in the Nd and Yb doped yttrium calcium oxyborate crystals*

PLENARY SESSIONS

10.30-11.00 Coffee Break

Chair: M.V. Fedorov (Russia)

11.00-11.45 Harm G. Muller (FOM-Institute, Atoms in Strong Field, Amsterdam, The Netherlands)

*Resonance Enhancement of Recollision Processes in Strong-Field Photoionization as Revealed by Accurate Numerical Simulation*

**Monday, July 5, 1999**

Chair: W. Sandner (Germany)

09.00-09.45 Louis DiMauro (Brookhaven National Laboratory, Upton, USA)  
*Strong-Field Interactions in the Tunneling Regime*

Chair: J. Janszky (Hungary)

09.45-10.30 W. Howard Lowdermilk (Lawrence Livermore National Laboratory, Livermore, USA)  
*NIF and the Path to Inertial Fusion Energy*

**Tuesday, July 6, 1999**

Chair: I.V. Yevseyev (Russia)

09.00-09.45 Nikolai I. Tankovich (Thermolase Co., USA)  
*Laser Cosmetical Treatments in Dermatology*

Chair: W. Schleich (Germany)

09.45-10.30 D. DiVincenzo (IBM T. J. Watson Research Center, USA)  
*Prospects for Quantum Computing*

## **Seminar 1**

### **Modern trends in laser physics**

**Friday, July 2, 1999**

**Chairs: O. Kocharovskaya (Russia) and Sajeew John (Canada)**

- 11.55-12.25 G. Welch, V. Sautenkov, Y. Rostovtsev (Texas, USA), M. Kash (Texas and Lake Forest, USA), A. Zibrov (Texas and Boulder, USA), L. Hollberg (Boulder, USA), M. Lukin (Cambridge, USA), E. Fry and M. Scully (Texas, USA and Garching, Germany)  
*Slow light and hot atoms*
- 12.25-12.55 János A. Bergou (New York, USA; Pécs, Hungary) and Marlan O. Scully (Texas, USA)  
*Correlated emission laser (CEL) and the CEL gyro*

#### **13.00-14.00 Lunch**

**Chairs: E. A. Vinogradov (Russia) and E. Wintner (Austria)**

- 14.00-14.30 P. Meystre and M.G. Moore (Tucson, USA)  
*Optical control and entanglement of matter wave fields*
- 14.30-15.00 M. Fleischhauer (Munich, Germany)  
*Radiative atom-atom interactions in optically dense media*
- 15.00-15.30 K.V. Krutitsky (Ulyanovsk, Russia), F. Burgbacher and J. Audretsch (Konstanz, Germany)  
*Microscopic theory of the interaction of ultracold dense Bose and Fermi gases with electromagnetic field*
- 15.30-15.55 V.S. Bagnato, G. Telles, A. Antunes, P. Cardona, M. Santos, and L. Marcassa (Sao Paulo, Brazil)  
*The study of cold collisions involving different species*
- 15.55-16.15 V.I. Yukalov, E.P. Yukalova and V.S. Bagnato (Sao Paulo, Brazil)  
*Excited coherent modes of ultracold trapped atoms*

#### **16.15-16.45 Coffee Break**

**Chairs: P. Domokos (Hungary) and J.D. Franson (USA)**

- 16.45-17.15 J.M. Zavada (London, UK)  
*Optical properties and novel applications of rare earth-doped III-nitride semiconductors*
- 17.15-17.45 A.S. Shumovsky, Ö.E. Müstecaplıoglu, and M. Ünsal (Bilkent, Turkey)  
*Stokes parameters and stokes operators*

SEMINAR 1 --- MODERN TRENDS IN LASER PHYSICS

- 17.45-18.15 V. Samartsev (Kazan, Russia)  
*Long-lived photon echo and optical phase memory*
- 18.15-18.40 A.A. Kalachev and V.A. Zuikov (Kazan, Russia)  
*Long-lived optical superradiance in the Van-Vleck paramagnetics*
- 18.40-19.05 S.N. Bagayev, S.V. Chepurov, A.G. Khamoyan, V.M. Klementyev,  
S.A. Kuznetsov, V.S. Pivtsov, and V.F. Zakharyash (Novosibirsk,  
Russia)  
*High stable femtosecond Ti:Sa laser and its use in the metrology*
- 19.30-23.00 **Welcome Party**

**Saturday, July 3, 1999**

**Chairs: Charles Bowden (USA) and Lev Rivlin (Russia)**

- 11.00-11.35 Sajeev John (Toronto, Canada)  
*Quantum and nonlinear optics in a photonic band gap*
- 11.35-12.10 Michael Scalora, Mark J. Bloemer, Charles M. Bowden (Huntsville  
and Redstone Arsenal, USA)  
*Laminated photonic band structures with high conductivity and high  
transparency: metals under a new light*
- 12.10-12.45 Shi-Yao Zhu (Hong Kong)  
*Spontaneous emission in three-dimensional photonic crystals*

**12.45-14.00 Lunch**

**Chairs: Janos A. Bergou (Hungary) and John Zavada (UK)**

- 14.00-14.35 J.D. Franson, T.B. Pittman, and B.C. Jacobs (Laurel, USA)  
*Nonlinear optics at low intensities using photon exchange interac-  
tions*
- 14.35-15.10 Hans Briegel (Munich, Germany)  
*Quantum computing in optical lattices*
- 15.10-15.45 D.G. Cory, T.F. Havel, R. Laflamme, Y. Sharf, S. Somaroo, C.H.  
Tseng (Cambridge, USA)  
*Quantum computing using NMR*
- 15.45-16.20 Charles M. Bowden, and Shawn D. Pethel (Redstone Arsenal, USA)  
*Quantum computation via laser pulse induced electronic excitation  
controlled electron-nuclear transferred hyperfine interactions*

**16.20-16.45 Coffee Break**

**Chairs: V.S. Bagnato (Brazil) and Prem Kumar (USA)**

- 16.45-17.20 P.H. Bucksbaum (Ann Arbor, USA)  
*Quantum control and quantum algorithms*

# SEMINAR 1 --- MODERN TRENDS IN LASER PHYSICS

- 17.20-17.50 P. Domokos (Budapest, Hungary), V. Lefevre, J. Hare, J.M. Raimond, L. Davidovich (Paris, France), and I. Protsenko (Moscow, Russia, Rio de Janeiro, Brazil)  
*Quantum theory of a thresholdless laser*
- 17.50-18.15 R.N. Shakhmuratov (Leuven, Belgium; Kazan, Russia), A. Szabo (Ottawa, Canada), G. Kozyreff and P. Mandel (Bruxelles, Belgium), R. Coussement and J. Odeurs (Leuven, Belgium)  
*Dark state in ruby: analysis of the feasibility*
- 18.15-18.40 B.-U. Runge, B. Böck, U. Bolz, J. Boneberg, V. Buyok, P. Brüll, J. Eisenmenger, C. Häfner, S. Herminghaus, J. Schiessling, and P. Leiderer (Konstanz, Germany)  
*Magneto-optic studies of superconductors down to nanosecond time resolution*
- 18.40-19.05 Yu.E. Lozovik, A.L. Dobryakov, S.P. Merkulova (Troitsk, Russia), S.A. Kovalenko, V.M. Farztdinov (Berlin, Germany), V.A. Karavanskii (Moscow, Russia)  
*Femtosecond Spectroscopy of Porous and Cluster Materials*
- 19.05-19.25 P. García-Fernández, C. Cabrillo (Madrid, Spain)  
*Quantum noise reduction in singly resonant optical devices*
- 19.25-19.45 A.V. Kir'yanov (Leon, Mexico; Moscow, Russia), Yu.O. Barmenkov and A.N. Starodumov (Leon, Mexico), V.-P. Lippanen, J. Vanhanen, T. Jaaskelainen (Joensuu Univ, Finland), N.M. Kozhevnikov (St.-Petersburg, Russia)  
*Study of phase grating recording in 4-keto Bacteriorhodopsin using phase-modulated beams technique*

## Sunday, July 4, 1999

Chairs: T. Kiss (Hungary) and M.I. Kolobov (Germany)

- 11.55-12.25 E. Wintner, I.T. Sorokina, E. Sorokin (Wien, Austria)  
*Diode-pumped ultrashort pulse solid-state lasers*
- 12.25-12.55 Richard L. Fork, Lisa J. Gamble, William M. Diffey (Huntsville, USA)  
*Spatially extended modelocking*

### 13.00-14.00 Lunch

Chairs: A. Mysyrowicz (France) and R. Shakhmuratov (Russia)

- 14.00-14.35 O. Kocharovskaya, R. Kolesov and Yu. Rostovtsev (Texas, USA, and Moscow, Russia)  
*Coherent optical control of gamma-ray nuclear spectra*
- 14.35-15.05 Lev Rivlin (Moscow, Russia)  
*Cold atoms as a source of monochromatic and coherent nuclear gamma-radiation*

# SEMINAR 1 --- MODERN TRENDS IN LASER PHYSICS

- 15.05-15.35 V.I. Yukalov and E.P. Yukalova (Dubna, Russia)  
*Formation of directed beams from atom lasers*
- 15.35-16.00 A.A. Zadernovsky (Moscow, Russia)  
*Ignition of burst two-quantum generation of coherent gamma-photons*
- 16.00 - 16.20 Lev Rivlin (Moscow, Russia)  
*Transmission of cold atom interference pattern through  $(2+1)D$  potential well*
- 16.20-16.45 Coffee Break**

**Chairs: A. Gaeta (USA) and W.P. Schleich (Germany)**

- 16.45-17.15 V.M. Shalaev, W. Kim, V.P. Safonov, and R.L. Armstrong (Las Cruces, NM, USA)  
*Fractals in microcavities: New feasibilities for laser physics and photonics*
- 17.15-17.45 E.A. Vinogradov, Yu.E. Lozovik, Yu.A. Matveets, V.M. Farztdinov, A.L. Dobryakov (Troitsk, Russia)  
*Electron injection dynamics through the Shottky barrier*
- 17.45-18.15 Yu.E. Lozovik (Troitsk, Russia), A.M. Fedotov and N.B. Narozhny (Moscow, Russia)  
*Excitation of an atom in nonstationary cavity and dynamic Casimir effect*
- 18.15-18.35 Lev Rivlin (Moscow, Russia)  
*Is the Photon Mass Zero ? (Extraordinary photon behavior in context of cavity electrodynamics)*
- 18.35-18.55 A.M. Fedotov, N.B. Narozhny (Moscow, Russia), and Yu.E. Lozovik (Troitsk, Russia)  
*Dynamic Casimir effect in sudden approximation*
- 19.30-23.00 Conference Dinner**

## Monday, July 5, 1999

**Chairs: P. Meystre (USA) and V.V. Samartsev (Russia)**

- 11.00-11.30 W.P. Schleich (Ulm, Germany)  
*Quantum carpets and vortices in Bose-Einstein condensates*
- 11.30-12.00 A. Gatti, E. Brambilla (Milano, Italy), L.A. Lugiato (Como, Italy), and M. Kolobov (Essen, Germany)  
*Quantum entangled images*
- 12.00-12.25 M.I. Kolobov (Essen, Germany)  
*Noiseless amplification of optical images*

# SEMINAR 1 --- MODERN TRENDS IN LASER PHYSICS

12.25-12.50 A.V. Sergienko, A.F. Abouraddy, B.E.A. Saleh, and M.C. Teich (Boston, USA)  
*Large spatial entanglement and quantum interferometry*

**12.50-14.00 Lunch**

**Chairs: A. Gatti (Italy) and V.M. Shalaev (USA)**

14.00-14.30 Prem Kumar, Sang-Kyung Choi, and Michael Vasilyev (Evanston, USA)  
*Spatially broadband parametric amplification: quantum-noise correlations and noiseless optical amplification of images*

14.30-15.00 A. Maître, M. Vaupel, C. Fabre (Paris, France)  
*Transverse classical and quantum structures in a triply resonant OPO*

15.00-15.25 A. Czitrovszky, P. Jani, A. Nagy (Budapest, Hungary) and A. Sergienko (Boston, USA)  
*Photometric measurements of quantum efficiency using quantum two-photon field*

15.25-15.50 Z. Kis, T. Kiss, J. Janszky and P. Adam (Budapest, Hungary), S. Wallentowitz and W. Vogel (Rostock, Germany)  
*Detection of non-classical oscillations in phase-space by cascaded optical homodyning*

15.50-16.15 Guillaume Petite (Saclay, France)  
*Understanding the effects of ionizing radiation on matter with ultrashort pulsed lasers*

**16.15-16.45 Coffee Break**

**Chairs: P.H. Bucksbaum (USA) and A. Shumovsky (Turkey)**

16.45-17.15 Alexander L. Gaeta, Doug Homoelle, Kevin Moll, and Stephan Wielandy (Ithaca, USA)  
*Catastrophic collapse of ultrashort pulses in condensed matter*

17.15-17.45 S. L. Chin, A. Talebpour, S. Petit, A. Proulx and J. Yang (Laval University, Quebec, Canada)  
*From intense femtosecond pulse propagation into white light laser*

17.45-18.10 R. Sauerbrey, S. Niedermeier, F. Ronneberger, H. Schillinger (Jena, Germany), H. Wille, M. Rodriguez, L. Wöste, and P. Rairoux (Berlin, Germany)  
*Long range propagation of terawatt laser pulses in the earth atmosphere*

18.10-18.35 N. Akozbek and C. M. Bowden (Redstone Arsenal, USA), A. Talebpour and S. L. Chin (Laval University, Quebec, Canada)  
*Femtosecond pulse propagation in the air: Variational analysis*



SEMINAR 1 --- MODERN TRENDS IN LASER PHYSICS

- 18.35-19.00 A. Mysyrowicz, S. Tzortzakis, M.A. Franco, Y.-B. André, A. Chiron, B. Lamouroux, and B.S. Prade (Palaiseau, France)  
*Formation of a conducting plasma channel in air by self-guided femtosecond laser pulses*
- 19.00-19.25 M. Mlejnek, E.M. Wright, and J.V. Moloney (Tucson, USA)  
*A dynamic spatial replenishment scenario for femtosecond pulses propagating in air - A route to optical turbulence?*
- 19.25-19.45 A.V. Andreev (Moscow, Russia)  
*Interaction of atom with superstrong laser field*
- 19.45-20.00 F. Morales, E. Fiordilino and R. Daniele (Palermo, Italy)  
*Harmonic generation in presence of a multimode laser field*

**Tuesday, July 6, 1999**

**Seminar 1  
Subsection  
Physics Of Cold Atoms**

**Co-chairs: W.P. Schleich (Germany) and V.P. Yakovlev (Russia)**

- 11:00-11:25 Roy Glauber (Harvard University, USA)  
*Coherence and Correlations in Ultracold Atomic Fields*
- 11:25-11:50 Howard Carmichael (Oregon, USA)  
*Multi-atom effects in cavity QED with atomic beams*
- 11:50-12:15 Pierre Meystre, and E.V. Goldstein (Tucson, USA)  
*Recent progress in nonlinear atom optics*
- 12:15-12:40 S. Meneghini (University of Ulm), I. Jex, K.A.H. van Leeuwen, W. Schleich, V.P. Yakovlev, and M.R. Kasimov (Moscow, Russia)  
*Atomic beams in longitudinally modulated light crystals*
- 12.45-14.00 Lunch**
- 14:00-14:25 William Schieve, D. Johnson (Austin, USA)  
*Detection statistics in the micromaser*
- 14:25-14:50 Janos Bergou (New York, USA; Budapest, Hungary), M. Jacob, and Y. Abranyos (New York, USA)  
*Generation of correlated photon pairs in the resonance fluorescence of a bichromatically driven trapped four-level atom*
- 14:50-15:15 Krzysztof Wodkiewicz (Warsaw, Poland)  
*Fractional dynamics of the wave packets in phase space*
- 15:15-15:40 Alexander Kaplan (Baltimore, USA)  
*Laser-powered single-atom motional oscillator*

11.00-12.45

**Poster Session of Seminar 1**

**Chair: K.A. Prokhorov (Russia)**

1. P. Adam, A. Kárpáti, J. Janszky and E. Lugosi (Budapest, Hungary)  
*Relations between input and output states of integrated optical systems*
2. V.V. Apollonov, A.I. Artemyev, M.V. Fedorov, E.A. Shapiro (Moscow, Russia), and J.K. McIver (Albuquerque, USA)  
*Gas-plasma and superlattice free-electron lasers exploiting a medium with periodically modulated refractive index*
3. V.P. Bykov (Moscow, Russia)  
*Nature of photocounts and laser detecting of coherent optical signals*
4. A.A. Chernenko, I.M. Beterov, O.I. Permyakova (Novosibirsk, Russia)  
*Amplification without inversion on the transitions from autoionizing states of Yb atom*
5. Z.G. Melikishvili, M.I. Djibladze, L.E. Berdzenishvili (Tbilisi, Georgia)  
*Quasistationary laser plasma*
6. S. Szabó, P. Adam, and J. Janszky (Budapest, Hungary)  
*Phase optimized states via coherent-state superpositions*

**Seminar 2**  
**Strong-Field Phenomena**

**Friday, July 2, 1999**

**Chair: S.L. Chin (Canada)**

- 11.55-12.25 F. Krausz (Vienna, Austria)  
*Extreme nonlinear optics with few-cycle laser pulses*
- 12.25-12.55 Cs. Tóth, D.-E. Kim, B.C. Walker, T. Guo, C.W. Siders, A. Cavalieri, C.P. J. Barty (San Diego, USA)  
*Ultrafast coherent and incoherent and incoherent X-ray generation by inner-shell atomic processes induced by 25fs 1J pulses of high-power CPA lasers*

**13.00-14.00 Lunch**

**Chair: A. Maquet (France)**

- 14.00-14.30 M. Gavrila (Cambridge, USA)  
*Atomic spectroscopy in intense laser fields*
- 14.30-15.00 K.T. Taylor, J.S. Parker, D. Dundas, L.R. Moore, J.F. Mc Cann, E.S. Smith (Belfast, UK)  
*Laser-driven few-electron atoms and molecules*
- 15.00-15.25 R.M. Potvliege (Durham, UK)  
*Quasienergy spectrum and multiphoton dynamics*
- 15.25-15.50 A. Becker and F.H.M. Faisal (Bielefeld, Germany)  
*Multiple ionization processes in noble gas atoms in femtosecond laser pulses*
- 15.50-16.15 V.D. Taranukhin and N.Yu. Shubin (Moscow, Russia)  
*High order harmonic generation by multielectron atoms*

**16.15-16.45 Coffee break**

**Chair: M. Gavrila (USA)**

- 16.45-17.10 N.B. Narozhny and M.S. Fofanov (Moscow, Russia)  
*QED effects in a strong two-mode plane electromagnetic wave*
- 17.10-17.35 H.-J. Kull, J. Görlinger, and L. Plagne (Aachen, Germany)  
*Multielectron processes in electron-ion scattering in strong laser fields*
- 17.35-18.00 R. Karapetian (Moscow, Russia)  
*Motion of an atomic electron in strong laser field*

## SEMINAR 2 --- STRONG-FIELD PHENOMENA

- 18.00-18.25    A. Cionga (Bucharest, Romania)  
*Free-free transitions in electron-hydrogen*
- 18.25-18.50    Z. Kaminski, P. Panek and F. Ehlotzky (Innsbruck, Austria)  
*Asymmetry, angular and polarizational effects in relativistic free-free transitions in a powerful laser field*
- 19.30-23.00    **Welcome Party**

**Saturday, July 3, 1999**

**Chair: L. DiMauro (USA)**

- 11.00-11.25    S.P. Goreslavsky (Moscow, Russia)  
*Photoionization assisted by rescattering: quantum theory in semi-classical limit*
- 11.25-11.50    R. Kopold and W. Becker (Berlin, Germany)  
*Above-threshold ionization for elliptical polarization*
- 11.50-12.15    V.P. Krainov (Moscow, Russia)  
*Energy and angular distribution of relativistic electrons in a tunneling ionization of atoms by circularly polarized laser radiation*
- 12.15-12.40    S. Bivona, R. Burlon, C. Leone (Palermo, Italy)  
*Photoelectron current modulation in multiphoton detachment of H<sup>-</sup>*

**13.00-14.00    Lunch**

**Chair: V.P. Krainov (Russia)**

- 14.00-14.30    U. Eichmann, M. Dammasch, M. Dörr, W. Becker, H. Maeda and W. Sandner (Berlin, Germany)  
*Collective multielectron tunneling ionization*
- 14.30-15.00    B. Zon (Voronezh, Russia)  
*Many particle aspects of tunneling*
- 15.00-15.25    J. Bauer (Lodz, Poland)  
*Classical simulation for atoms and molecules in intense laser fields*
- 15.25-15.50    A. Scrinzi, M. Geissler, and T. Brabec (Vienna, Austria)  
*Quasistatic laser field ionization of Hydrogen and Helium*
- 15.50-16.15    M.A. Efremov and M.V. Fedorov (Moscow, Russia)  
*Classical and quantum-mechanical versions of the Kapitza-Dirac effect*

**16.15-16.45    Coffee break**

**Chair: H.G. Muller (The Netherlands)**

- 16.45-17.10    A.M. Popov, O.V. Tikhonova, and E.A. Volkova (Moscow, Russia)  
*Hydrogen atom in a strong laser field*

## SEMINAR 2 --- STRONG-FIELD PHENOMENA

- 17.10-17.35 R.M. Potvliege (Durham, UK)  
*Adiabatic stabilization of circular states: phase control in two-colour fields and magnetic coupling*
- 17.35-18.00 D. Bauer (Darmstadt, Germany)  
*Stabilization of two-electron systems in intense laser fields*
- 18.00-18.25 N.J. Kylstra, A. Patel and P.L. Knight (London, UK)  
*Laser pulse effects in the stabilization of atoms in intense, high frequency fields*
- 18.25-18.50 R. Parzhynski, M. Sobczak, and A. Wojcik (Poznan, Poland)  
*The effect of nonresonant  $l=1$ ,  $n=0$  electric dipole migration on Rydberg atom photoionization*

### Sunday, July 4, 1999

**Chair: N.B. Narozhny (Russia)**

- 11.55-12.20 A. Maquet, R. Taïeb, and V. Vénierd (Paris, France)  
*Relativistic effects in atom-laser interactions*
- 12.20-12.45 C.H. Keitel, S.X. Xu, C. Szymanowski, M. Casu and D.J. Urbach (Freiburg, Germany)  
*Relativistic laser-ion interactions: dynamics and X-ray radiation*

#### 13.00-14.00 Lunch

**Chair: A.M. Popov (Russia)**

- 14.00-14.30 S.L. Chin, A. Talebpour, and J. Yang (Quebec, Canada)  
*Inner shell electron ejection and fluorescence of molecules using intense femtosecond Ti-sapphire laser pulses*
- 14.30-15.00 A. Bandrauk (Shebrooke, Canada)  
*Phase control of ionization of molecules*
- 15.00-15.25 M. Ivanov, J. Karzhmarek, and P.B. Corkum (Ottawa, Canada)  
*Optical twister for molecules*
- 15.25-15.50 F.H.M. Faisal and A. Becker (Bielefeld, Germany)  
*Intense field ionization of molecules*
- 15.50-16.15 A.I. Andriushin and M.V. Fedorov (Moscow, Russia)  
*Orientation of molecules in a strong laser field*

#### 16.15-16.45 Coffee break

**Chair: S.P. Goreslavsky (Russia)**

- 16.45-17.10 P. Mulser, D. Bauer, S. Hain, and R. Ruhl (Darmstadt, Germany)  
*Present understanding of superintense laser-solid interactions*

## SEMINAR 2 --- STRONG-FIELD PHENOMENA

- 17.10-17.35 Zs. Tóth, B. Hopp, A. Mechler, Zs. Bor, S.D. Moustaisis, C. Kalpouzos and C. Fotakis (Szeged, Hungary)  
*Reflectivity transients on solid surfaces induced by high-power excimer laser irradiation*
- 17.35-18.00 G. Ferrante, N. Zarcone, S. Basile, P. Porshnev and O. Petrova (Palermo, Italy)  
*Evolution of highly anisotropic plasma distribution functions in strong laser fields*
- 18.00-18.25 S. Nuzzo, G. Ferrante, N. Zarcone, S. Basile (Palermo, Italy)  
*Elementary kinetic theory of strong field frequency and multiplication wave mixing*
- 18.25-18.50 V.P. Krainov and M.B. Smirnov (Moscow, Russia)  
*Thomas-Fermi metal clusters in a laser field*
- 19.30-23.00 **Conference Dinner**

### Monday, July 5, 1999

**Chair: F. Ehlötzky (Austria)**

- 11.00-11.25 M.Yu. Kuchiev and V.N. Ostrovsky (Sydney, Australia)  
*Quantum theory of a high harmonic generation as a three-step process*
- 11.25-11.50 I. Földes, J.S. Bakos, K. Gál, Z. Juhász, G. Kocsis, S. Szatmári, and G. Veres (Budapest, Hungary)  
*Properties of high harmonics generated by ultrashort UV laser pulses on solid surfaces*
- 11.50-12.15 C. Lyngå, M. Bellini, C. Delfin, D. Descamps, M.B. Gaarde, T.W. Hänsch, J.-F. Hergott, A. L'Huillier, H. Merdji, J. Norin, P. Salieres and C.-G. Wahlström (Lund, Sweden)  
*Coherence properties and applications of high-order harmonics*
- 12.15-12.40 M.A. Sukharev and V.P. Krainov (Moscow, Russia)  
*High-order harmonics generated by  $H_2^+$  in a strong laser field*

**13.00-14.00 Lunch**

**Chair: F. Faisal (Germany)**

- 14.00-14.30 Ph. Martin (Saclay, France)  
*Time-resolved photoemission spectroscopy using high-order harmonics*
- 14.30-15.00 D.B. Milosevich, and A.F. Starace (Berlin, Germany)  
*Control of high harmonic generation and laser-assisted X-ray-atom scattering with static electric and magnetic fields*
- 15.00-15.25 B. Carre, L. Le D'erooff, P. Salieres, D. Joyeux (Saclay, France)  
*Spatial and temporal coherence of high-order harmonics*

## SEMINAR 2 --- STRONG-FIELD PHENOMENA

- 15.25-15.50 R. Grobe (Normal, IL, USA)  
*Generation of higher harmonics in relativistic ionization of magnetically dressed atoms*
- 15.50-16.15 V. Vénierd, R. Taïeb, and A. Maquet (Paris, France)  
*A simple model for harmonic generation on atomic clusters*
- 16.15-16.45 Coffee break**

**Chair: W. Becker (Germany)**

- 16.45-17.10 S. Meyer, B. Chichkov and B. Wellegehausen (Hannover, Germany)  
*High-order harmonic generation in absorbing media and high order parametric amplification*
- 17.10-17.35 V.T. Platonenko and V.V. Strelkov (Moscow, Russia)  
*Attosecond pulse generated with an ultrashort laser pulse*
- 17.35-18.00 D. Persano Adorno, G. Ferrante, M. Zarcone (Palermo, Italy)  
*Far-infrared harmonic generation in semiconductors. A Monte-Carlo simulation*
- 18.00-18.25 N.B. Narozhny and M.S. Fofanov (Moscow, Russia)  
*Relativistic ponderomotive effect*
- 18.25-18.50 M.V. Fedorov and D.R. Bitouk (Moscow, Russia)  
*Relativistic ponderomotive forces*

**Tuesday, July 6, 1999**

**11.00-12.45**

### Poster Session of Seminar 2

**Chair: M.V. Fedorov (Russia)**

1. V.E. Chernov and B.A. Zon (Voronezh, Russia)  
*X-ray laser induced nuclear decay: resonance internal conversion*
2. S.M. Fedorov, O.V. Tikhonova, and M.V. Fedorov (Moscow, Russia)  
*Interference vs. transient stabilization of Rydberg atoms in a strong light field*
3. A. Jaron, J.Z. Kaminski, and F. Ehlotzky (Innsbruck, Austria)  
*Asymmetries in the angular distribution of above threshold ionization in an elliptically polarized field*
4. V.L. Kalashnikov, D.O. Krimer, T.G. Poloyko (Minsk, Belarus)  
*Weak-nonlinear solution in the solid-state laser with semiconductor saturable absorber*
5. Z. Kaminski and F. Ehlotzky (Innsbruck, Austria)  
*Transitional effects in electron-atom scattering in a laser field near the interface between radiation filled space and vacuum*

## SEMINAR 2 --- STRONG-FIELD PHENOMENA

6. V.T. Platonenko and V.V. Strelkov (Moscow, Russia)  
*Analytical formulae for high harmonic amplitudes*
7. S. Varro, Gy. Farkas, and F. Ehlotzky (Innsbruck, Austria)  
*Generation of X-rays by irradiating metal surfaces with a powerful laser beam in a presence of a strong static electric field*
8. S.V. Popruzhenko, S.P. Goreslavsky (Moscow, Russia)  
*Scalings of the interference structure in the photoelectron distribution on the ATI plateau*
9. C. Reinhardt, S. Scorupka, H. Kawano, B. Chichkov, and B. Wellegehausen (Hannover, Germany)  
*Efficient VUV and XUV generation with a fs KrF laser*
10. V.D. Taranukhin (Moscow, Russia)  
*Large relativistic ponderomotive forces in electromagnetic field of arbitrary strength*
11. C. Trump, H. Rottke, G. Korn, M. Wittemann, and W. Sandner (Berlin, Germany)  
*Probing strong field photodissociation of*
12. V.I. Trunov, A.V. Kirpichnikov, E.V. Pestryakov, V.V. Petrov (Novosibirsk, Russia)  
*Formation of ultrafast optical pulses in lasers with ultrawide gainband*
13. E.A. Shapiro, M. Kalinski, P. Bellomo, J. Eberly (Moscow, Russia; Rochester, NY, USA)  
*Quantum control via localized Rydberg states*
14. V.V. Suran and I.I. Bondar (Uzhgorod, Ukraine)  
*Direct two-electron mechanism of doubly-charged ions formation: resonant structure of  $A^{2+}$  yield*
15. D.F. Zaretsky and E.A. Nersesov (Moscow, Russia)  
*The time duration of high harmonic generation in the process of ATI*
16. D.F. Zaretsky and E.A. Nersesov (Moscow, Russia)  
*The amplification of high harmonics in the process of ATI*
17. Z. Kaminski, P. Panek and F. Ehlotzky (Innsbruck, Austria) (See lecture: Sunday, 18:25)  
*Asymmetry, angular and polarizational effects in relativistic free-free transitions in a powerful laser field*
18. S. Haan (USA)  
*Near threshold one-photon photoionization in a one-dimensional delta-function system*



## Seminar 3 Laser Spectroscopy

**Friday, July 2, 1999**

**Chair: W. Hogervorst (The Netherlands)**

- 11.55-12.25    W.J. Witteman (Enschede, The Netherlands)  
*Prospects for extending the stable pulse duration of short wave  
eximer lasers*
- 12.25-12.55    F. K. Tittel (Houston, USA)  
*Novel diode based sensors for gas sensing applications*
- 12.55-14.00    Lunch**

**Chair: F.K. Tittel (USA)**

- 14.00-14.35    A.E. Dudelzak, E.V. Browell, A.I. Carswell (St-Hubert, Canada)  
*Progress in ORACLE (Ozone Research with Advanced Cooperative  
Lidar Experiment): joint NASA-CSA development of a space-based  
ozone dial*
- 14.35-15.10    G. Djotyan, J. Bakos, Zs. Sörlei, J. Szigeti, P. Ignácz, Z. Tóth,  
(Budapest, Hungary)  
*Interaction of frequency-chirped bichromatic laser pulses with mul-  
tilevel atoms: Writing and storage of optical information*
- 15.10-15.45    A.V. Sokolov, D.D. Yavuz, D.R. Walker, G. Y. Yin, and S.E. Har-  
ris (Stanford, USA)  
*Subfemtosecond pulse generation by molecular modulation*
- 16.15-16.45    Coffee break**

**Chair: S.N. Bagayev (Russia)**

- 16.45-17.20    N.N. Rubtsova, E.B. Khvorostov, S.A. Kochubey, L.S. Vasilenko  
(Novosibirsk, Russia), and I.V. Yevseyev (Moscow, Russia)  
*Polarization properties of the photon echoes in the Ytterbium vapor:  
dependence on the exciting pulse areas*
- 17.20-17.55    R.N. Shakhmuratov (Leuven, Belgium)  
*Locking and unlocking of the transient nutation signal*
- 17.55-18.25    V.A. Zuikov, J. Gallus, O. Ollikainen, A.K. Rebane, U.P. Wild, A.A.  
Kalachev, V.V. Samartsev (Kazan, Russia)  
*The spatial and spectral properties of the femtosecond photon echo  
and the angle echo-spectroscopy possibility*

### SEMINAR 3 --- LASER SPECTROSCOPY

18.25-18.50 V.A. Zuikov, A.A. Kalachev, V.V. Samartsev, A.M. Shegeda (Kazan, Russia)  
*Optical Superradiance in the  $\text{LaF}_3:\text{Pr}^{3+}$  Crystal*

19.30-23.00 **Welcome Party**

**Saturday, July 3, 1999**

**Chair: W.J. Witteman (The Netherlands)**

11.00-11.35 U. Hinze, B.N. Chichkov, E. Tiemann, B. Wellegehausen (Hannover, Germany)

*Resonant CW four-wave mixing and parametric amplification*

11.35-12.10 A.F. Semerok, B. Larousse, A. Pailloux (Saclay, France)

*Optical diagnostics system for measuring SUPER-ERIC plasma parameters*

12.10-12.45 W. Chen, J. Burie, D. Boucher (Dunkerque, France)

*A widely tunable difference-frequency spectrometer for high-resolution infrared laser spectroscopy*

12.45-14.00 **Lunch**

**Chair: P.E. Toschek (Germany)**

14.00-14.30 Z. Bozoki, A. Mohacsi, M. Szakall, G. Szabo and Z. Bor (Szeged, Hungary)

*High stability external cavity diode laser system for photoacoustic gas detection*

14.30-15.00 A. Kireev, M.A. Gubin, E.V. Koval'chuk, M.V. Petrovskiy, E.A. Petrukhin, A.S. Shelkovnikov, D.A. Tyurikov (Moscow, Russia)

*Double-mode He-Ne and diode-pumped  $\text{RbCl}:\text{Li}/\text{F}_A(\text{II})$  lasers for precise measurements in the 3.0-3.4  $\mu\text{m}$  region*

15.00-15.25 L. Feenstra, H.M.J. Bastiaens, P.J.M. Peters and W.J. Witteman (Enschede, The Netherlands)

*On the extension of the pulse length of a discharge excited ArF excimer laser*

15.25-15.50 T. Nagy, P. Simon, S. Szatmári (Szeged, Hungary)

*Spectral evolution of short pulses in KrF amplifiers*

16.15-16.45 **Coffee break**

**Chair: N.N. Rubtsova (Russia)**

16.45-17.10 J.H. Eberly, E.A. Shapiro, M. Kalinski, P. Bellomo (Rochester, USA)

*Quantum phase lock in Rydberg atoms*

### SEMINAR 3 --- LASER SPECTROSCOPY

- 17.10-17.35 S.N. Bagayev (Novosibirsk, Russia)  
*Highly stable femtosecond lasers and their application for the creation of a new optical clock*
- 17.35-18.00 E.V. Baklanov, A.V. Denisov (Novosibirsk, Russia)  
*High precision calculations of the low-lying energy levels of the three body Coulomb system*

**Sunday, July 4, 1999**

**14.00-15.40**

### **Poster Session of Seminar 3**

**Chair: V.M. Yermachenko (Russia)**

1. T.G. Mitrofanova, V.A. Zuikov, A.A. Kalachev, V.V. Samartsev (Kazan, Russia)  
*Accumulated long-lived photon echo in the Van-Fleck paramagnetics and problem of optical memory*
2. A.V. Taichenachev, A.M. Tumaikin and V.I. Yudin (Novosibirsk, Russia)  
*Simple theoretical model for electromagnetically induced absorption: Four-state N-atom*
3. O.N. Prudnikov, A.V. Taichenachev, A.M. Tumaikin and V.I. Yudin (Novosibirsk, Russia)  
*New friction force caused by spontaneous radiation pressure*
4. N.P. Konopleva, A.M. Tumaikin (Novosibirsk, Russia)  
*Magnetically induced amplification without inversion in three-level cascade scheme*
5. A.V. Taichenachev, A.M. Tumaikin, V.I. Yudin (Novosibirsk, Russia)  
*Two-dimensional sideband Raman cooling and  $m = 0$  Zeeman state preparation in an optical lattice*

## **Seminar 4**

### **Solid State Lasers and Nonlinear Optics**

**Sunday, July 4, 1999**

**Chair: Yusuke Mori ( Japan)**

- 11.55-12.20 H.P. Weber, R. Weber, Th. Graf (Bern, Switzerland)  
*High-power diode-pumped solid-state lasers*
- 12.20-12.45 K. Yoshida (Osaka, Japan), A. Ikesue (Kyoto, Japan), T. Taira (Oka-  
zaki, Japan)  
*Optical properties and diode pumped operation of high-  
performance Nd doped YAG ceramics for solid-state lasers*
- 12.45-14.00 **Lunch**

**Chair: H.P. Weber (Switzerland)**

- 14.00-14.25 P. Maak, L. Jakab, P. Richter (Budapest, Hungary), H.J. Eichler, B.  
Liu ( Berlin, Germany)  
*Acoustooptic Q-switching of an Er:YSGG solid state laser*
- 14.25-14.50 S. Kueck, L. Fornasiero, E. Mix, G. Huber (Hamburg, Germany)  
*Investigation of Cr doped MgO and Sc<sub>2</sub>O<sub>3</sub> as potential laser sources  
for the near infrared spectral range*
- 14.50-15.15 V. Peters, E. Mix, L. Fornasiero, K. Petermann, G. Huber (Hamburg,  
Germany)  
*Efficient laser operation of Yb<sup>3+</sup> : Sc<sub>2</sub>O<sub>3</sub> and spectroscopic charac-  
terization of Pr<sup>3+</sup> in cubic sesquioxides*
- 15.15-15.35 T. Sorokina, S. Naumov, E. Sorokin, E. Wintner (Wien, Austria) and  
A.V. Shestakov (Moscow, Russia)  
*Compact diode-pumped continuous-wave Cr:YAG laser vskip 1 cm*
- 15.35-15.55 N.N.Il'ichev, P.P.Pashinin (Moscow, Russia)  
*Continious wave operation of F<sup>2</sup>— color centers laser in LiF at  
1.15 mcm*
- 15.55-16.15 G.A. Bufetova, V.F. Seregin, I.A. Shcherbakov, V.B. Tsvetkov  
(Moscow, Russia), A.M. Zabaznov (Minsk, Belarus)  
*Analysis and modeling of the thermolens dynamical behavior in  
pulsed solid-state lasers*
- 16.15-16.45 **Coffee break**

# SEMINAR 4 --- SOLID STATE LASERS AND NONLINEAR OPTICS

Chair: R. Szipocs (Hungary)

- 16.45-17.15 I.V. Klimov, D.A. Nikolaev, I.A. Shcherbakov, V.B. Tsvetkov (Moscow, Russia)  
*Neodimium lasers, operating at different wavelength on  $4F_{3/2} - 4I_{13/2}$  transition in a number of crystal hosts*
- 17.15-17.40 L. Ivleva, N. Bogodaev, N. Polozkov, P. Lykov, V. Osiko (Moscow, Russia)  
*Holographic recording and beam coupling in barium-strontium niobate single crystals doped with cobalt*
- 17.40-18.05 A.V. Podlipensky, N.V. Kuleshov, V.G. Shcherbitsky, V.P. Mikhailov, V.I. Levchenko, V.N. Yakimovich (Minsk, Belarus)  
 *$Cr^{2+}$ :ZnSe and  $Co^{2+}$ :ZnSe saturable-absorber Q-switches for the Er:glass laser at 1.54  $\mu m$*
- 18.05-18.30 A.A. Lagatsky, N.V. Kuleshov, V.P. Mikhailov (Minsk, Belarus)  
CW laser performance of diode-pumped Yb:KYW and Yb:KGW
- 19.30-23.00 Conference Dinner

## Monday, July 5, 1999

Chair: I.A. Shcherbakov (Russia)

- 11.00-11.30 Yusuke Mori, Masashi Yoshimura, Takatomo Sasaki (Osaka, Japan)  
*Recent development of nonlinear optical borate crystals for UV generation*
- 11.30-11.55 József A. Fülöp, Attila P. Kovács, Zsolt Bor (Szeged, Hungary)  
*Improved two-pass second harmonic generation of femtosecond pulses*
- 11.55-12.20 P.B.W. Burmester, T. Kellner, S. Kueck, K. Petermann, G. Huber (Hamburg, Germany)  
*Type I noncritically phase-matched second harmonic generation in (Gd, Y) COB?*
- 12.20-12.45 P. Apai, S. Lako, R. Szipocs (Budapest, Hungary) and M.B. Danailov (Trieste, Italy)  
*Broad-band photorefractive phase conjugation in a dispersive scheme*
- 12.45-14.00 Lunch

Chair: N.N. Il'ichev (Russia)

- 14.00-14.25 R. Menzel, V. Raab, D. Lorenz, A. Heuer (Potsdam, Germany)  
*New developments of phase conjugating mirrors based on stimulated Brillouin scattering*

#### SEMINAR 4 --- SOLID STATE LASERS AND NONLINEAR OPTICS

- 14.25-14.50 Michiyuki Endo and Gorachand Ghosh (Tsukuba, Japan)  
*Estimation of phase noise in a mode-locked tunable laser*
- 14.50-15.15 R. Szipocs (Budapest, Hungary), A. Euteneuer, E. Finger, M. Hofmann (Marburg, Germany), A. Kohazi-Kis (Budapest, Hungary)  
*Multi-color, mode-locked Ti : sapphire laser with zero pulse jitter*
- 15.15-15.40 P. Tosin, W. Luthy, and H.P. Weber (Bern, Switzerland)  
*Manufacture of fibers with multiple claddings*
- 15.40-16.05 A.V. Kir'yakov, N.N. Il'ichev (Moscow, Russia), and V. Aboites (Leon, Mexico)  
*Polarisation bistability in a Nd:YAG laser passively Q-switched with a Cr<sup>4+</sup>: YAG crystal under the weak resonant signal control*

#### 16.15-16.45 Coffee break

Chair: Michiyuki Endo (Japan)

- 16.45-17.10 N.V. Kuleshov, A.V. Podlipensky, V.G. Shcherbitsky, V.P. Mikhailov, V.I. Levchenko, V.N. Yakimovich (Minsk, Belarus)  
*Laser performance of diffusion-doped Cr<sup>2+</sup>: ZnSe*
- 17.10-17.35 D.O. Krimer, V.L. Kalashnikov, I.G. Poloyko (Minsk, Belarus)  
*Weak-nonlinear soliton in the solid-state laser with semiconductor saturable absorber*
- 17.35-18.00 V.L. Kalashnikov, D.O. Krimer, F. Mejid, I.G. Poloyko (Minsk, Belarus)  
*Automodulations in cw solid-state ultrashort lasers mode-locked by kerr-lensing*
- 18.00-18.25 L.A. Kotomtseva, S.G. Rusov (Minsk, Belarus)  
*Multivalued steady states, switching regimes and nonlinear dynamics in a solid state laser with a saturable absorber*
- 18.25-18.50 E.V. Pestryakov, V.V. Petrov, V.I. Trunov, A.V. Kirpichnikov, A.I. Alimpiev (Novosibirsk, Russia)  
*Prospects for superbroadband laser media based on beryllium aluminate crystals*

## **Seminar 5**

### **Laser Methods in Medicine**

**Monday, July 5, 1999**

**Chairs: G. Müller (Germany) and S. Gonchukov (Russia)**

- 11.00-11.40 G. Müller, D. Schaldach, A. Roggan, J. Helfmann, J. Beuthan (Berlin, Germany)  
*Laser optics in medical diagnostics and therapy*
- 11.40-12.15 A. Sergeev (Nizhniy Novgorod, Russia)  
*Recent developments in optical coherence tomography*
- 12.15-12.45 H. van den Bergh, J.-P. Ballini, M. Sickenberg (Lausanne, Switzerland)  
*Photodynamic therapy of age related macular degeneration: pharmacokinetics and therapeutic results*
- 12.45-14.00 Lunch**

**Chairs: H. Weber (Switzerland) and A. Priezzhev (Russia)**

- 14.00-14.30 G. Klebanov, M. Kreinina, T. Chichuk, V. Christophorov, A. Grabovschiner (Moscow, Russia)  
*Molecular and cell mechanisms of laser therapy*
- 14.30-15.00 D. Chorvat, Jr., J.A. Mateashik, J. Urban, P. Mach, I. Lajdova, A. Chorvatova, M. Dushinska (Bratislava, Slovak Republic)  
*Interaction of Merocyanine 540 with biological membranes*
- 15.00-15.25 B. Eppich, J. Beuthan, C. Dressler, G. Müller (Berlin, Germany)  
*Optical phase measurements on biological cells*
- 15.25-15.50 J. Lademann, H.-J. Weigmann (Berlin, Germany), H. Schaefer (Paris, France), G. Müller, W. Sterry (Berlin, Germany)  
*Laser spectroscopic investigation of the stability of coated titanium microparticles used in sunscreens*
- 15.50-16.15 I. Ferincz (Szeged, Hungary), I. Ratkay (Budapest, Hungary), Zs. Bor (Szeged, Hungary)  
*Age and intended correction dependence of effective ablation rate during photorefractive keratectomy*
- 16.15-16.45 Coffee Break**

# SEMINAR 5 --- LASER METHODS IN MEDICINE

**Chairs: J. Lademann (Germany) and L. Gáspár (Hungary)**

- 16.45-17.20 E. Stranadko, G. Ponomarev, A. Ivanov, P. Tolstykh, U. Koraboyev, V. Mechkov, L. Glikin, V. Ashmarov, R. Baum, M. Riabov, A. Reshetnikov (Moscow, Russia)  
*Research and recent achievements in laser photodynamic therapy*
- 17.20-17.55 M. Frenz, K. Kostli (Bern, Switzerland), G. Paltauf, H. Schmidt-Kloiber (Graz, Austria), H. Weber (Switzerland)  
*Tissue characterization by optoacoustic wave detection*
- 17.55-18.30 V. Loschenov, G. Kisilev, A. Strattonnikov, A. Prokhorov (Moscow, Russia)  
*The methods of laser induced fluorescence spectroscopy of tissue in vivo for diagnostics and therapy control*

## Tuesday, July 6

**Chairs: H. Weber (Switzerland) and J. Lademann (Germany)**

- 11.00-11.35 A. Priezzhev (Moscow, Russia)  
*Laser diagnostics of pathologies by measuring structural and dynamics parameters of biological fluid*
- 11.35-12.10 E. Sobol, A. Sviridov, M. Kitai, (Troitsk, Russia), J. Gilligan, N.H. Tolk, G. Edwards (Nashville, USA)  
*Time-resolved light scattering measurements of cartilage and cornea denaturation due to FEL irradiation*
- 12.10-12.45 T. Juhasz, R. Kurtz, Z. Sacks, D. Cabrera, L. Turi, G. Spooner (Ann Arbor, USA), G. Djotyan (Budapest, Hungary)  
*Applications of femtosecond lasers in corneal surgery*

### 12.45-14.00 Lunch

**Chairs: S. Gonchukov (Russia) and A. Priezzhev (Russia)**

- 14.00-14.25 V. Volnukhin, M. Kochetkov, V. Koslov, T. Fedorova, V. Grebenyuk, O. Vybornova (Moscow, Russia)  
*Low-intensive laser therapy of patients with granuloma annulare and its effect on microcirculation in the skin and blood lipid peroxidation*
- 14.25-14.50 V. Orlov, S. Bagayev, S. Panov (Novosibirsk, Russia)  
*The study of motility of individual microparticles by phase sensitive laser spectroscopy*
- 14.50-15.15 R. Steiner, A. Pohl, A. Bentele, T. Meier (Ulm, Germany)  
*Laser Doppler sensor for laser assisted injection*



**14.00-16.15**

**Poster Session of Seminar 5**

**Chairs: S. Gonchukov (Russia) and A. Priezzhev (Russia)**

1. A. Soundoukov, N. Yuschuk, S. Gonchukov (Moscow, Russia)  
*The new approach to the treatment of adults from toxic diphtheria*
2. E. Bálint, A. Veres, I. Ocsovszki, I. Béládi, Z. Várkonyi (Szeged, Hungary)  
*Flow Cytometric Analysis of Cell Membrane Events Induced by Interferon-Alpha*
3. T. Kraposhina, G. Minkina (Moscow, Russia)  
*Laser Therapy of Squamous Cell Hyperplasia of Vulva*
4. I. Manuchin, T. Kraposhina, G. Minkina, T. Zacharova, L. Studenaya (Moscow, Russia)  
*Laser Therapy of Condyloma Acuminata of Vulva*
5. G. Minkina, I. Manuchin, L. Studenaya, T. Kraposhina (Moscow, Russia)  
*CO<sub>2</sub> laser in the Treatment of the Wide-Spread Condylomatosis of Cervix Uteri*
6. T. Chichuk, G. Lubchenko, E. Podgornaya, E. Pozdnyakova, G. Klebanov, E. Stranadko (Moscow, Russia)  
*Biophysic Bases of Low-Intensive Laser Irradiation Action on Leucocytes*
7. T. Chichuk, G. Lubchenko, E. Stranadko (Moscow, Russia)  
*Action of Russian photosensitizers: Photohem and Photosense upon blood*
8. E. Mironova (Moscow, Russia)  
*Laser and Nonlaser Effects on Bioelectrical Plant Activity*
9. S. Skipetrov (Moscow, Russia)  
*Diffusing-wave imaging of flow in turbid media*
10. S. Skipetrov (Moscow, Russia)  
*Refractive index of random media*
11. P. Pleshanov, Yu. Bykovsky, A. Chuchalin, E. Pleshanova (Moscow, Russia), D. Sayers (Raleigh, USA)  
*Chemical speciation of heavy metals from radioactive contaminated soils in Russia and lung tissues of Chernobyl clean-up workers*
12. N. Larionova, I. Maksimova (Saratov, Russia)  
*Scattering of laser light wave on spherical particles of lens biotissue*

**Symposium on**  
**Status and Future Directions of High-Power Laser**  
**installations**

**Tuesday, July 6, 1999**

**Chair: W. Sandner (Germany)**

- 14.00-14.45     Henry Hutchinson, (Rutherford-Appleton Laboratories, UK)  
*EU activities in High-Power, High-Energy Lasers*
- 14.45-15.30     Jean-Paul Chambaret (Palaiseau, France)  
*Towards 100 Terawatt/ 10 Hz User Facilities: the TMR- FIRE project*
- 15.30-16.15     M.D. Perry, H.T. Powell, Jim Murray and E.M. Campbell (Livermore, USA)  
*Status and future directions of high power, high intensity laser facilities*
- 16.15-16.45     Coffee Break**

**Chair: W. Sandner (Germany)**

- 16.45-17.30     Katsumi Midorikawa et al. (RIKEN, Japan)  
*Guided Femtosecond Ti:Sapphire Laser Pulses*
- 17.30-18.15     Thomas Moeller, HASYLAB / DESY (Germany)  
*The VUV- High Power Free Electron Laser at DESY: Layout and Applications*
- 18.15-18.25     Closing Remarks

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